Papilionaceae. The author believes that certain of the mycotropic forms are limited to acid soils because of the use, through the help of their mycorrhiza, of organic nitrogen compounds, and these are most abundant in absence of lime. —WM. CROCKER.

Hybrids of maize.—COLLINS[18] makes a contribution to the genetics of maize by reporting results from his studies of hybrids between pod corn and a type discovered by Dr. W. B. GERNERT, in which the pistillate inflorescence is replaced by a compound inflorescence branched as is ordinarily the case with the tassel.

In his experiments the progeny of ordinary *tunicata* plants has always consisted of approximately 3 tunicates to 1 normal. In other words, the usual tunicate ear is a heterozygous dominant. The homozygous dominant is apparently a type which makes up about one-third of the total number of tunicate plants and is characterized by greatly enlarged tassels containing both staminate and pistillate flowers, and the ear either with enlarged sterile spikelets or wanting. *Zea ramosa*, on the other hand, is recessive to normal.

In 1914 a cross was made between half-tunicate (heterozygous) ♂ and *Zea ramosa* ♀. Of 9 first generation plants, 4 were tunicate and 5 normal, the tunicate ears being "half-tunicate" and showing no trace of *ramosa* characters. From 2 selfed F_1 non-tunicate ears 85 plants were raised, of which 65 were normal and 17 *ramosa*. From 3 selfed F_1 half-tunicate ears 326 plants matured. Among the *tunicata* plants of this lot there were both *tunicata* and *ramosa* tassels, and in the latter a new type appeared which had indeterminately branched inflorescences embryonic in nature. This peculiar type (termed cauliflower) occurred in both lateral and terminal inflorescences, although more common in the former. A simple Mendelian interpretation of these results is given.—E. M. EAST.

A New Zealand biological station.—Canterbury College has recently set apart a tract of land in the mountainous center of South Island, New Zealand, and provided it with buildings suitable for a biological station. It is situated at an altitude of 1850 ft. on the Cass River and is surrounded by mountains, some of which are over 5000 ft. high. Descriptions of its situation,[19] its physiography,[20] and its vegetation[21] seem to show that it is well suited to the purpose for which it was intended. The vegetation displays a wide

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[18] COLLINS, G. N., Hybrids of *Zea ramosa* and *Z. tunicata*. Jour. Agric. Research **9**:383–395. *pls. 13–21*.

[19] CHILTON, CHAS., Introduction and general description of station. Trans. New Zealand Inst. **47**:331–335. 1915.

[20] SPEIGHT, R., The physiography of the Cass district. *Ibid.* **48**:145–153. 1916.

[21] COCKAYNE, L., The principal plant associations in the immediate vicinity of the station. *Ibid.* **48**:166–186. 1916.

diversity of types, including bits of forests of the southern beech, *Nothofagus Cliffortioides*, various scrub associations, and low tussock grassland, with transitions through reed and sedge swamp to open water. Of these the tussock grassland is by far the most important and interesting, representing as it does a montane association covering some 6,000,000 acres ranging from an altitude of 1000 to 3000 ft. It is dominated by the two smaller tussock grasses, *Poa caespitosa* and *Festuca nova-zealandiae*, in many places changed by burning and sheep grazing so as to permit the invasion of other grasses and herbs. The association not only presents many interesting ecological problems, but its proper utilization is a matter of great economic importance,[22] since one-seventh of the occupied land of New Zealand is covered with this vegetation. At present it is largely given over to sheep grazing, but without producing satisfactory returns.—GEO. D. FULLER.

Anatomy of Gnetum moluccense.—LA RIVIÈRE[23] has described the structure of a single branch of *Gnetum moluccense*. The greater part of the paper is devoted to a study of the accessory (secondary) steles outside of and concentric with the first stele. The remarkable conclusion is reached that they originate in the nodes from ramifications of bundles passing to the lateral branches and then grow *downward* (toward the base of the stem), the cambiums appearing at lower and lower levels in the inner cortex. The difficulties in this conception, that the direction of their growth is the reverse of the usual one, will present themselves to both morphologists and physiologists. Communications of the accessory steles with each other and with the central one, originally discovered by BERTRAND but overlooked by all later workers, are carefully traced and appear to be quite numerous. The different tissues of the whole stem are briefly described, but according to the author's observations present no features of outstanding morphological significance. This is perhaps the reason that no conclusions are mentioned in regard to the affinities of Gnetales with either gymnosperms or angiosperms.—W. P. THOMPSON.

Nitrogen determination.—Several years ago FOLIN modified the Kjeldah method of determining nitrogen so that small quantities could be determined with sufficient accuracy. DAVIS,[24] who has used this modified method extensively for determination of nitrogen in small quantities of plant materials, reports that it is specially good for demonstrating proteolytic changes, for determination of nitrogen in minute plant sections or organs, and the effects of various factors upon the nitrogen content of plant tissues. The method is

[22] COCKAYNE, A. H., Some economic considerations concerning montane tussock grassland. *Ibid.* **48**:154–165. 1916.

[23] LA RIVIÈRE, HENRIETTE C. C., Sur l'anatomie et l'epaississement des tiges du *Gnetum moluccense* Karst. Ann. Jard. Bot. Buitenzorg **30**:32–58. *pls. 4–12.* 1916.

[24] DAVIS, A. R., A note on the adaptability of the Folin micro-Kjeldahl apparatus for plant work. Ann. Mo. Bot. Gard. **2**:407–412. 1916.